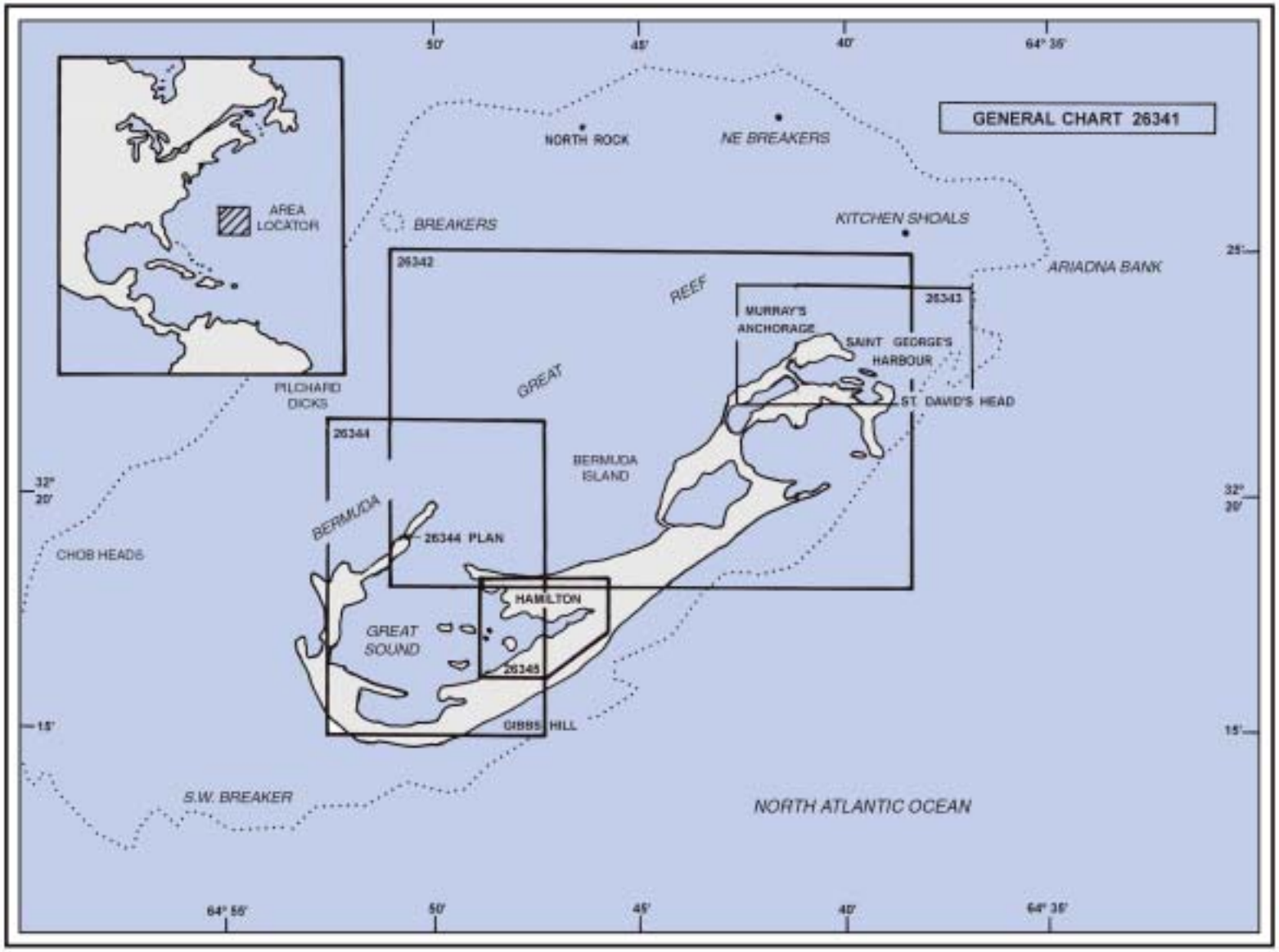

Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **1** — CHART INFORMATION

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SECTOR 1

BERMUDA

Plan.—This segment describes Bermuda in general, then the sea approaches and inner water passages. The description is NE to SW.

General Remarks

1.1 Bermuda (32˚18'N., 64˚45'W.) lies about 565 miles ESE of Cape Hatteras, the nearest landfall, and in a mid-ocean position adjacent to direct routes from the United States Gulf ports to the Mediterranean and Northern Europe, and to direct routes from United States East Coast ports to South America.

Of the 300 emergent above-water features of this group on the Bermuda Great Reef, about half are only above-water rocks. About 20 of the remaining 150 islands are inhabited and the seven largest are connected by bridge and causeway to Bermuda Island (Hamilton).

Bermuda Island is the largest, followed by Saint George's Island and Saint David's Island to the NE, and Somerset Island, Watford Island, Boaz Island, and Ireland Island to the SW.

The islands have a total surface area of almost 21 square miles, and extend almost 14 miles in length. Saint George's Harbour and Saint George lie in the N portion of the chain. Great Sound and Hamilton, Ireland Island Dockyard, and Port Royal Bay lie in the S part.

Winds—Weather.—Bermuda and the Bahamas, while some 725 miles apart, are subject in large measure to the same natural forces that produce the general climate and current conditions within the SW portion of the North Atlantic Ocean. The consequences of these conditions differ primarily in degree in that Bermuda is an oceanic island while the Bahamas tend to be more coastal islands.

The principal sources of climate and current conditions affecting Bermuda and the Bahamas are more or less constant NE trade winds. As these partake of the general North Atlantic clockwise movement circulating around the semi-permanent areas or high barometric pressure alternating between the Azores and Bermuda.

As this high fluctuates seasonally in position and intensity, so the N limit of the trade winds varies during the year. In winter it lies in about 25˚N, while in summer it shifts to about 30˚N.

The fluctuating N limit of the NE trade winds thus falls approximately between Bermuda and the Bahamas, and thereby becomes a contributing factor to differences in local wind and current conditions.

The West Indian hurricane, the principle aberration within the general forces governing the production of climate conditions, develops more often than not well to the E and in the latitudes of the low barometric pressure doldrums.

It travels slowly W within the belt of the NE trade winds and, with an increase in speed generally recurves NE in about 30˚N.

The season of its occurrence is late May to early December and the prevalence of its track is such that it affects the Bahamas considerably more than Bermuda.

Northers are a lesser aberration within the general climate producing forces. They originate as an escape from the continental United States of large cold air masses which in their movement S and SE, decrease from storm velocities to strong winds that tend to veer from W thru NW to N. Land breezes are negligible.

Bermuda, situated somewhat above 32˚N, lie outside the area of direct NE trade winds influence and within the axis of the general clockwise circulation obtaining in the North Atlantic, with the consequence that the wind direction differs basically from that in the trade wind belt to the S.

Wind from the SW predominates between March and August while winds from the W and NW prevail between December and February. Fall winds are variable. Average wind velocity is between a Force 3 and 4, somewhat less in summer than in winter.

With the breakdown of the Azores high in September and October and thereafter with the passage of extra tropical cyclones moving E from the U.S. mainland, gale winds from the SW thru NW occur with increased frequency. Tropical cyclones originating during this period and developing into storms commonly pass W of the islands, less commonly to the E.

During the summer, gale force winds are infrequent and blow from SE thru NE only when in association with hurricanes. Many of these latter pass near the islands but only about once a year on the average pass close enough to produce locally experienced hurricane winds.

Bermuda has a maritime climate that is rather sultry and generally quite mild. The average high temperature is 30˚C between July and September and the average low seldom falls below 14˚C at other times of the year. October is the wettest month, while April is the driest. Fog is rare and visibility is commonly impaired only during heavy rainfall.

Tides—Currents.—Ocean currents affecting Bermuda and the Bahamas are almost entirely dependent on prevailing winds which, in general cause a clockwise flow around the North Atlantic basin. The local effects of these currents are dependent upon the position of the observer within the general flow.

Tidal currents are, with exception, negligible in the open sea and, while generally weak, become matters of concern only within confined channels leading through reefs and the like. In general, flood currents set directly onto reefs while ebb currents set directly off.

Tides for Bermuda and the Bahamas are mixed. There are two daily highs and lows of near equal height when the moon is near the equator.

Then two daily highs and lows with increasing diurnal inequality as the moon declination increases, then essentially

only one daily high and low when the moon declination maximizes.

The mean sea level is affected by the wind, and depths may be 0.3 to 0.4m less than charted.

Depths—Limitations.—Bermuda Great Reef is the name given to the extensive reef system on which the Bermuda Islands are located. The outer dangers and approach channels through the reef will be described later in the text.

Aspect.—The following landmarks may be useful: Saint George's Harbour has been reported to be radar conspicuous; Folly Towers, conspicuous on the slope of Town Hill; and Gibbs Hill, near the S part of Bermuda Island's S extremity. Wreck Hill, near the W extremity of the same island, is a conical hill and may be useful if approach is from the N or S.

Town Hill (32˚19'N., 64˚44'W.), located in the N portion of Bermuda, is the highest point in the group.

The larger islands are somewhat wooded, and generally characterized by round hills which seldom rise above a height of 61m.

Pilotage.—Pilotage is compulsory except for naval vessels and yachts and is available in daylight only. The boarding ground is located 2 miles ENE of Saint David's Head with the E tip of the island, bearing 240˚. A light is displayed from St. David’s Head.

The pilot station, call sign "Bermuda Pilots," may be contacted on VHF channels 12 and 16.

Regulations.—An IMO Area to be Avoided has been established in the waters surrounding Bermuda, and may best be seen on the chart. Because of the great danger of stranding on the extensive reefs to the W, N, and NE of the islands, and for reasons of environmental protection, all vessels carrying cargoes of oil or hazardous materials, and all other vessels of more than 1,000 grt, whether or not bound for Bermuda ports, should remain outside of the area.

A voluntary Vessel Traffic Management Service (VTMS) is in effect for vessels passing within 30 miles of Bermuda, and is mandatory for vessels sailing for ports in Bermuda or intending to navigate within the Area to be Avoided.

The following is a summary of regulations dealing with vessel movements, berthing, and the duties of masters. Traffic control is exercised through Bermuda Harbour Radio. See the "Signals" topic for details.

1. Ocean vessels have absolute right of way over local craft.
2. Vessels shall proceed at moderate speed.
3. The discharge or dumping of fuel oil, ballast, rubbish or any other materials is prohibited.

The following regulations govern Main Ship Channel, Five Fathom Hole, The Narrows, Murray's Anchorage, and South Channel to Grassy Bay. Additional regulations will be cited in the text where appropriate:

1. An inbound vessel has right-of-way, and should fly her national colors while navigating these channels to claim priority.
2. An outbound vessel should keep off and away from the channel at safe and sufficient distance, until the inbound vessel has cleared the channel.
3. No vessel should anchor in the channels, except in an emergency or through stress of weather and should clear the channel as soon as possible.

Vessels heading for Bermuda ports, and making a scheduled call, must radio their ETA at Five Fathom Hole 18 to 24 hours in advance, confirming at least 3 hours prior to arrival. Vessels making an unscheduled call must contact Bermuda Harbour Radio at least 24 hours in advance of arrival, stating:

1. Purpose of call and local agent.
2. ETA at Five Fathom Hole.
3. Nature and quantity of any dangerous or toxic cargo.
4. GRT, length, and draft.
5. Any restriction on ability to maneuver.
6. Any defects to navigational equipment, and whether large scale charts of Bermuda are available.

All vessels must remain at least 20 miles offshore until instructed to approach the pilot boarding ground.

All vessels should maintain a continuous watch on VHF channel 12 while transiting the buoyed channels, and should obtain permission before transiting The Narrows and Town Cut Channel.

Vessels intending to enter the area to be avoided should contact Bermuda Harbour Radio and state nationality, position, course, speed, destination, type of cargo, and draft. Vessels should maintain watch on VHF channel 16.

Vessels passing within 30 miles of Bermuda are requested to contact Bermuda Harbour Radio on VHF channel 16 initially, stating:

1. Type of vessel.
2. Nationality.
3. Laden or in ballast (tankers only).
4. Position, course, and speed.
5. Any course changes within 30 nautical miles of Bermuda.

Bermuda Harbour Radio, call sign "Bermuda Harbour" (ZBM), may be contacted on 2182 kHz, 2582 kHz, and VHF channels 10, 12, 16, 27, and 68, and is equipped with radar. A remote VHF station is located at Gibbs Head Light.

Anchorage.—It has been reported that good hurricane anchorages for small craft may be found in Smiths Sound, Great Bay, Polly's Bay, Riddell's Bay, and Bermuda Freeport.

Anchorage while awaiting the pilot is available in Five Fathom Hole, but the local authorities should be consulted before attempting to anchor here.

Directions.—The sea approaches to Bermuda are generally in deep water and free of dangers except for two off-lying seamounts to the SW, and the sunken dangers of Bermuda Great Reef.

In times of poor visibility, the only safe approach to Bermuda is from the SE. It is recommended that vessels schedule their arrival in an area well to the NE of the islands during daylight hours, since the dredged entrance passages are without lighted ranges.

Entry at night is permitted only in an emergency. It is recommended that vessels approaching from the SW adjust their course to stand well off the SE side of the Islands and remain in deep water until the E extremity of the Islands can be rounded and a final approach made in safety from seaward.

It is recommended that vessels approaching from the W and NW remain in deep water well to the N of the Bermuda Great Reef, and adjust their courses in order to safely clear the E extremity of the reef and arrive at a position about 10 miles NE of the harbor entrance.

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A final approach may then be made with Saint David's Island Light bearing more than 226˚ to clear all known dangers.

A radiobeacon and DGPS station at the NE end of Bermuda near St. Davids Head may be of assistance during an approach.

It is recommended that vessels proceed with caution when transiting an extensive submarine exercise area to the S of the islands. Oceanographic buoys have been reported about 13 miles S of Saint David's Head.

Caution.—The attention of all mariners is drawn to the dangers and hazards of close approach to the reefs which surround Bermuda, especially to the N and NE of the islands.

They extend in places to a distance of 12 miles from the visible land and are virtually unmarked by navigational aids at their extremities. The outer sea lights and buoys (North Rock light and the light buoy in the NE approaches) may not be reliable due to inaccessibility for maintenance, except in very calm weather.

Ships on passage, with no intention of calling at Bermuda, are advised to give the islands a berth of at least 30 miles, observing that little distance is lost on the passage by so doing and nothing is gained by a closer approach. On the contrary, stranding or shipwreck has occurred all too often through the years with pollution of the surrounding reefs and beaches and destruction of ecological life as well as possible ruin of the economy of the islands.

Ships enroute to Bermuda should be certain of their position and should make final approach from the E and S because the only entrance to the sheltered waters is at the SE side of the islands off Saint George's Harbour.

Here, pilots are available and can be embarked in daylight hours. Entry at night is dangerous and prohibited and close approach in dark hours should not be attempted without local knowledge.

Three sub-surface moorings and one surface mooring have been established 50 miles SSE of Bermuda. Equipment is deployed for the purpose of scientific study on pollution and sediment. The area is centered 31˚40'N 64˚10'W and has a drift radius of 10 miles. Vessels are cautioned to keep clear and avoid dumping or discharging waste in this area.

Bermuda has established extensive Marine Conservation Areas. Local officials should be consulted for details.

In poor visibility, vessels should heave-to rather than attempt to enter as the beacons and buoys are not radar or visually conspicuous.

Fish traps may be encountered.

Magnetic anomalies exist in the vicinity of Bermuda. Normal magnetic variation values are evident along a line extending SE from Ireland Island across the entrance to Hamilton Harbor. To the NE of the line, values are commonly 0.5˚ to 1.5˚ above normal with somewhat higher values in one or two minor areas, e.g. Clarence Cove.

Values SW of the line are commonly below normal such that a value of at least 3.5˚ below normal is to be expected in the entrance to Port Royal Bay, between King's Point and Grace Island. However, near Hogfish Cut there is a small area with values in excess of 2.0˚ above normal. When swinging ship in order to correct compasses, it is recommended that vessels choose a location outside the 200m curve.

Approaches to Bermuda

1.2 Bermuda Great Reef is the name given to the reef on which Bermuda is located. Dangers extend up to 12 miles N and NW of the island chain.

Between Saint David's Head and Gibbs Hill, the SE edge of the reef extends 0.2 to 3.2 miles offshore.

Two off-lying banks, or seamounts, of coral are SW of Bermuda.

Plantagenet Bank (32˚00'N., 65˚10'W.), about 23 miles SW of Bermuda's SW extremity, has the form of truncated cone which rises steeply from the sea floor to a comparatively level summit having an area of about 5 miles square and a least known depth of 47.5m.

An obstruction covered by 29m, the remains of Argus Island Tower, lies near the SE shoulder of the bank.

A local magnetic anomaly, with irregular values of from 2˚ above to 5˚ below normal, has been observed over and in the vicinity of Plantagenet Bank.

1.3 **Challenger Bank** (32˚05'N., 65˚03'W.), about 14 miles SW of Bermuda Island, is similar to Plantagenet Bank in size and shape, but differs in that it has a least known depth of 42m.

Ariadne Bank, with depths of 20m, is reported to be about 6 miles NE of Saint David's Head.

South West Breaker lies about 2 miles SW of Gibbs Hill. Chaddock Bar and Little Bar lie about 3.5 and 5.5 miles W, respectively, of the same point. Long Bar, at the SW corner of the reef, lies 8 miles W of Gibbs Hill and breaks in gales.

Chub Heads, on the W edge of the reef, lies about 2.5 miles N of Long Bar and break in NW gales. A lighted beacon with Racon stands on the reef.

Between Chub Heads and North Rock,15 miles NE, the reef consists of extensive coral flats with depths of less than 1.8m and numerous patches and heads on some of which the sea breaks. These include Western Ledge Flats and Pilchard Dicks among others. A light stands on Western Ledge Flats.

1.4 **North Rock** (32˚28'N., 64˚46'W.), marked by a light, consists of three sharp pinnacles, 2.4m high, on a flat reef that dries in places.

Great Breaker Ledge Flat extends 0.75 mile ENE from a position about 0.6 mile NE of North Rock. North East Breakers, about 1.5 miles farther E are nearly always marked by breakers.

Two detached patches, with least depths of 9.4m, are 1.5 miles farther ENE.

Dangerous wrecks are situated about 2 miles W and 1.2 miles E of North East Breakers Light.

Kitchen Shoals, with a least depth of 1.8m, is located 4.5 miles NNE of Saint David's Head.

Kitchen Shoals lighted beacon, a red and white glass reinforced plastic tower on a concrete tripod, 14m high, is fitted with a radar reflector, marking Kitchen Shoals.

There are depths of less than 11m within 1 mile N and E of the shoal. A sunken wreck lies about 2.5 miles ENE of Kitchen Shoals Light.

Mills Breaker lies about 1.5 miles S of Kitchen Shoals.

Mills Breaker Ledge is a detached portion of the reef that extends about 1 mile S of Mills Breaker.

1.5 Approach channels.—See the General Remarks topic at the beginning of this sector (paragraph 1.1) for pertinent information pertaining to vessels approaching Bermuda.

Mills Breaker Channel passes outside Kitchen Shoals and Mills Breaker Ledge into Five Fathom Hole.

Sea Venture Shoals lie W of Five Fathom Hole. Sea Venture Channel passes between Mills Breaker and Sea Venture Shoals, but is only useful to small vessels with local knowledge.

Jacks Flats, with a least depth of 14.3m, lie across the entrance to Five Fathom Hole. There is foul ground about 1.3 miles NE of Saint David's Head.

The following berths are located relative to Saint David's Head Light:

1. Bearing 219˚ and about 1 mile distant, in depths of 11.9 to 18.3m.
2. Bearing 224˚ and about 1 mile distant, in depths of 16.7 to 19.8m.

Five Fathom Hole lies 1 mile NNE of Saint David's Head, and provides the principal entrance through the reefs to The Narrows and Town Cut Channel.

The area offers temporary exposed anchorage, open to all winds except those between SSW and WNW. The area has no protection from the sea except that afforded by the reefs. The bottom is rocky. A charted anchorage area is available N of the dredged channel, which shows depths from about 10.1 to 20.1m.

Care must be taken to select a clear sandy spot as depths are uneven, without crops of coral and rock, which may be detected from aloft.

Take care not to veer too much cable as it may foul. Vessels should be prepared to put to sea if winds begin shifting N.

Anchorage is available S of the dredged channel leading from Five Fathom Hole, which should be used only after consulting with the local authorities. Vessels should select a sandy spot, avoiding the rock and coral out crops visible from aloft.

Northeast and Northwest Sides of Bermuda

1.6 Saint David's Head (32˚22'N., 64˚39'W.), the E extremity of Saint David's Island, is a bold, rocky promontory 26.8m high. The summit of Mount Hill, about 0.3 mile SW of the head, is marked by a light.

A radiobeacon transmits from a position 0.2 mile NE of Saint David's Head Light.

An aero light is exhibited from the control tower of Kindley Field airport, on the 33m summit of Saint David's Island, 1.2 miles W of Saint David's Lighthouse.

Numerous red obstruction lights are exhibited as aids to aircraft, from various buildings, towers, and masts throughout the islands.

On Cooper's Island, the SE extremity of Saint David's Island, there are a number of masts and also an aero radiobeacon.

Saint David’s Island Light

Saint Catherine Point (32˚23'N., 64˚40'W.), the N extremity of Saint George's Island, is a prominent, isolated bluff; Fort Catherine stands on the summit. A white flagstaff is conspicuous on the face of the fort.

The land to the S of the isolated bluff is mostly wooded, and rises to a height of 50m. Fort Victoria lies about 0.3 mile S of Saint Catherine Point, with a conspicuous hotel close SE.

To the SE, 0.4 mile off Fort Victoria, is a radio tower elevated at 49.7m; there are other masts in this locale. Fort George is about 0.5 mile SW of Fort Victoria, where a conspicuous flagstaff, marked by obstruction lights, stands about 78m high.

Saint George’s Harbour

1.7 Saint George's Harbour (32˚22'N., 64˚40'W.) (World Port Index No. 9940), in the N part of Bermuda, is a small, largely landlocked shoal water basin sheltered by Saint George's Island and Saint David's Island.

Aspect.—Saint George's Island is quite hilly throughout and tends to rise and fall off steeply on its NE and NW sides. Saint Catherine Point, the N extremity of the island, is a conspicuous isolated bluff which, surmounted by fortifications, rises inland and up the wooded slopes of a dominating hill surmounted by the fortifications of Fort Victoria.

The Saint George community lies scattered on the basin side of the slopes falling away from Fort Victoria. Fort George signal station, close SW of Saint George, is atop a hill with a

conspicuous flagstaff which displays red obstruction lights and flies the distinctive blue ensign. Sugarloaf Hill (Cherrystone Hill), farther SW, is a conical and conspicuous landmark when viewed from the E.

Saint David's Island is quite hilly throughout the area of its original configuration, facing Saint George's Harbour and the sea to the E, and is quite level throughout the area which, by means of reclamation, presently extends the island well to the W, S, and in the SE, to Coopers Island.

Saint David's Head, reported radar conspicuous at 17 miles, is a bold, rocky promontory at the NE end of the island.

Castle Harbour is the largely shoal water area confined between Saint David's Island and Bermuda Island. It is entered from sea by small craft with local knowledge through Castle Roads, a narrow winding passage which, marked seaward by Gurnet Rock, leads in between Southampton Islet to the NE, and Old Castle (Charles Island) to the SW. Gurnet Rock is conspicuous and, from the SE, has the appearance of a cone. Access from the W is by means of a small craft channel at Barge Bridge, a bridge at the N end of the causeway joining Saint David's Island with Bermuda Island.

The sea enters Saint George's Harbour through the shallow openings between the many wooded and hilly islets blocking the E side of the harbor.

Anchorage.—Saint George's Harbour has anchorage in depths of 9.1 to 14.6m over stiff clay, poor holding ground. Anchoring vessels should stay clear of the fairway, taking into account the tidal currents, and the vessel's swing. Tidal currents flow directly into the harbor on a rising tide, and out on a falling tide.

The former U.S. Naval Air Station, Bermuda, occupies the larger part of Saint David's Island. It comprises a military airfield (Kindley Field), with its support activities, and a civilian airport (Bermuda Airport).

Marginal Wharf, on the S side of Saint George's Harbour, is a landing place for launches from vessels anchored farther out in the harbor.

Directions.—Town Cut Channel, the principal passage and the only one suitable for ocean vessels, is a narrow, slightly dog-legged channel dredged through the coastal bank lying both outside and inside the harbor leading in between Saint George's Island, to the N, and Higgs Island and Horseshoe Island, to the S.

The initial approach from Sea or Five Fathom Hole is made through a portion of the cut for The Narrows, which shows a least depth of 11.6m. Town Cut Channel approach has a minimum width of 76m and a depth of 8.2m at MLW.

Vessels, entering Saint George's Harbour by way of Town Cut Channel, steer on a heading of 260˚ near the center of the channel and then proceed until in position about 1 mile E of Higgs Island, where they ease to starboard and continue on into the harbor with the assistance of the aids marking the outer and inner reaches of Town Cut Channel.

It is recommended to transit Town Cut Channel at high water and proceed at a minimum speed to maintain steerage; large vessels should not enter when winds from the NNE thru SSE exceed a velocity of 16 knots.

All vessels are cautioned that a sheer is generally experienced in the vicinity of Horseshoe Island.

Saint George's Channel, a secondary natural passage with a least depth of 4.6m in the fairway, crosses the coastal bank to the SE of Town Cut Channel and then proceeds through the deep water trench between Paget Island and Smiths Island. The several reaches of this passage are marked by aids which cannot always be relied on because of their condition. Local knowledge is essential.

Jenkins Boiler Channel, entered close SE of Saint George's Channel, is a narrow passage available to vessels with local knowledge, which crosses the coastal bank in a least depth of 4.9m with Fort Cunningham on Paget Island bearing about 269˚.

Bremen Cut and The Narrows continue Jenkins Boiler Channel and Saint George's Channel to the S of Smiths Island in shoal depths suitable only for small craft.

At the W side of Saint George's Harbour Ferry Reach, between Saint George's Island and Saint David's Island NW side, is a narrow shoal water passage which, available to small craft of drafts less than 2.4m, joins Saint George's Harbour with Castle Harbour.

1.8 Saint George (Saint George's Town) (32˚23'N., 64˚41'W.) (World Port Index No. 9940), the former capital of Bermuda, is a small community and tourist center lying on the N side of Saint George's Harbour.

Depths—Limitations.—The principal alongside berthing facilities lie WSW of Ordnance Island and consist of several municipal wharves with alongside depths of 9m. A cruise ship berth, located on the S side of Ordnance Island, allows a maximum draft of 8.5m.

It is reported that the largest ship to enter Saint George's Harbour was 191m long, however, size would be controlled by draft and weather conditions. A dolphin berth, operated by Esso Bermuda, on the end of a pier 100m long, is situated on the S side of Murray's Anchorage. Tankers up to 38,000 dwt, 213m loa, maximum draft 10.4m, can be accommodated.

Castle Harbour Hotel, on the NE side of Hamilton Island and Fricks Tower on the SW entrance point of Castle Harbour, are prominent.

Caution.—It has been reported (1998) that vessels transit The Narrows and approach the piers during daylight hours only.

Great Sound and Approaches

1.9 The approaches to Great Sound, the large bight in the S part of Bermuda, lead in from sea by way of several passages. They proceed first N of Saint George's Island, then wind through the extensive but much-encumbered lagoon between the NW side of the islands and Bermuda Great Reef, and finally end at Grassy Bay and the channel dredged through the coral ridge across the Great Sound entrance.

Depths are a limiting factor and vary throughout the approaches, particularly in the area of the lagoon where they are quite irregular. The least depth in the passage to Grassy Bay by way of North Channel was reported to be 11.6m. The least depth by way of South Channel was reported as being 8.8m.

Tides—Currents.—The duration of slack water varies greatly ranging from no slack to a period of 2 hours. With a NE

wind, the tide rises more quickly and falls more slowly than it does with a SW wind. On the rising tide, the tidal current sets W round Saint David's Head into Saint George's Harbour and through The Narrows, nearly in the direction of the channel, as far as **Saint Catherine Point** (32˚23'N., 64˚40'W.) where it sweeps round to about WSW; its rate varies from about 0.2 to 2 knots according to the strength of the wind.

On the falling tide, the tidal current sets at about the same rate in a NE direction towards Saint Catherines Point, where it diverges, part setting ESE and SE through the channel. Abreast Sea Venture Shoals, the direction of the tidal stream is uncertain. Abreast the approaches to Saint George's Harbour, the rate of the tidal stream is increased by the streams flowing out of that harbor.

Depths—Limitations.—The Narrows, the principal seaward entrance to the passage proceeding to Great Sound, is a narrow, dredged channel which leads in from sea and through that portion of the Bermuda Great Reef that is close to the NE side of Saint George's Island. It is about 2.5 miles long, about 151m wide, and has a reported least depth of 11.6m. Shoal water, sunken rocks, and coral heads abound on each side of the channel.

Regulations.—See also the Regulations topic at the beginning of the sector (paragraph 1.1).

Inbound vessels should avoid South Channel W of Buoy No. 24 if there is an outbound vessel between Buoy No. 24 and Beacon No. 30, or in Grassy Bay. Vessels should not overtake in this portion of the channel.

Caution.—Buoys marking The Narrows can be displaced from position by heavy weather.

1.10 Murray's Anchorage, at the W end of The Narrows, is an extensive, largely unencumbered and comparatively deep water basin limited to the N by Three Hill Shoals and to the W and SW by Baileys Bay Flats. Vessels commonly anchor throughout the basin when unable to anchor seaward of The Narrows (e.g. because of heavy weather), or unable to enter Saint George's Harbour, or when awaiting berth at the oil terminal on Saint George's Island.

Anchorage berths are best seen on the chart.

Tobacco Bay, close WSW of Saint Catherine Point, is sheltered from all but W winds and conveniently available as a small boat landing for vessels at anchor farther out in the basin.

Esso Oil Terminal, distinctive because of its conspicuous silver-colored storage tanks, is about 2 miles SW of Saint Catherine Point. A pipeline pier extends offshore from the terminal for a distance of about 100m to the tanker terminal.

North Channel, the more indirect of the two inner passages between The Narrows and Great Sound, winds through the Bermuda Great Reef lagoon for a distance of about 12 miles. The Crescent, about two-thirds of the way from The Narrows, is a short reach wherein the channel shifts from a largely E to W direction then generally a N to S trend.

The Chimneys or Brangmans Spots, at the NE turn into this reach, is the shallowest part of the entire channel with a least depth of 11.6m.

White Flats, near the SW turn, is a shoal water patch through which the channel is dredged to a least depth of 11.9m.

North Channel is marked by aids which have been reported to be difficult to identify.

1.11 South Channel, the more direct passage to Great Sound but of lesser depth than North Channel, roughly parallels the NW side of Saint George's Island and Bermuda Island. It is about 9 miles long and has a least depth of 8.8m. Its reaches are quite clear and comparatively deep throughout while its reaches, for a distance of 6 miles between Tepping Shoals and Grassy Bay, are much encumbered and comparatively shoal.

Vessels intending to transit South Channel are commonly guided by charted aids to navigation.

Anchorage is prohibited due to submarine cables over much of South Channel, as may best be seen on the chart.

Grassy Bay is a small, unencumbered and relatively deep basin that lies in the immediate approach to the sunken ridge extending across the entrance to Great Sound. It has good anchorage in 11 to 14.6m, marl, in a number of charted single anchor berths. During storm winds from the N, it is recommended that vessels anchor with a good scope of chain. Cruise ships anchor at this location.

Several anchorage berths, which are reserved for British warships, can best be seen on the chart.

1.12 **Ireland Island Dockyard** (32˚19'N., 64˚50'W.) (World Port Index No. 9950) is on the W side of Grassy Bay where, as the Bermuda Freeport, it comprises all of the S Yard of the former British naval establishment on the N part of Ireland Island. It includes the sheltered North Basin and South Basin, but not some 305m of berthing space in the S part of this latter nor portions of the North Yard which are reserved for British naval use.

A cruise ship pier has been established on the outer side of North Breakwater, with charted depths of 11.2m. The berth measures 300m in length with depths alongside of 10.3m.

An obstruction, with a least depth of 10.9m, lies about 0.3 mile NE of the North Breakwater Head.

North and South Basins show generally charted depths of 5.1 to 15.3m. An obstruction is charted with a depth of 7.9m. A wreck is located at the N end of North Basin near a small craft marina.

Commercial Wharf lies in South Basin, and was reported to be dredged to a depth of 10.4m; however, charted depths are less. The wharf will accept a vessel with a maximum length of 182m, with a draft of 8.5m.

Great Sound and Environs

1.13 Great Sound is a spacious, almost landlocked bight in the S part of BermudaIsland formed by a series of connected islands and islets. These islands and islets continue in an arc around to Ireland Island.

Great Sound is obstructed in its entrance by coral heads and a sunken ridge that extends completely across from Ireland Island to Spanish Point.

A hilly promontory on Bermuda Island, and much encumbered within its area by several chains of islets which form Port Royal Bay, to the S and the approaches to Hamilton Harbor, to the E. Much of the SW part of the bight is clear, comparatively deep, and considered better hurricane anchorage than Hamilton Harbor.

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Dundonald Channel, the principal passage dredged through the sunken ridge across the entrance to Great Sound, proceeds from Grassy Bay and continues SSW well into the bight with a least depth of 11.3m. Close inside the ridge, it branches to the ESE and continues as a dredged channel with a least depth of 8.2m as far as Two Rock Passage, the narrow cut with a least depth of 8.2m, dredged through obstructions blocking the approaches to Hamilton Harbor.

Anchorage.—Due to the existence of old mooring lines, anchorage W of **Stag Rocks** (32˚18.8'N., 64˚49.9'W.),or in the SW portion of Great Sound is not recommended.

Regulations.—Regulations which control navigation within Great Sound are:

1. Inbound vessels must wait for outbound vessels which, whether approaching or in either Dundonald Channel or Two Rock Passage, have the right of way until well clear and, to indicate this right, hoist their national flag.
2. No vessel should enter Dundonald Channel and Two Rock Passage if it cannot do so safely.
3. A vessel forced to anchor in or near the fairway must move clear as soon as possible.
4. Vessels may proceed at a speed greater than 10 knots, only if necessary for vessel safety.

Caution.—Vessels intending to transit Great Sound by way of the channels described above, are commonly guided by charted aids to navigation.

Caution is particularly recommended when in transit of Two Rock Passage where backwash from the shore may induce a sheer.

Hogfish Cut, close off Bermuda Island's SW extremity, and several other intricate passages available only to small craft with local knowledge, lead in from sea and through the Bermuda Great Reef to the interior lagoon.

No convenient deepwater natural channel exists. The Narrows, previously discussed in paragraph 1.9, is the only means of entry to the Bermuda Lagoon for ocean vessels.

1.14 Hamilton (32˚18'N., 64˚47'W.) (World Port Index No. 9960) lies in an inlet on the E side of Great Sound and includes all the waters extending to the E from Two Rock Passage at Point Shares. It is divided into two parts by White Island.

The outer, or W harbor, offers anchorage, while E, or inner harbor, holds the berthing complex.

Hamilton is located on the N side of the harbor and is the governmental, commercial, and social capital of the islands.

Hamilton is the principal port of Bermuda. A channel leads from the open sea to Murray's Anchorage for ships with a draft up to 7.3m. Vessels then proceed along North Shore into Grassy Bay. From this bay, Dundonald Channel and Two Rock Passage lead into Hamilton itself.

There are 795m of quays with depths ranging up to 7.8m. Ro-ro vessels use Berth No. 7, container vessels use Berths No. 7 and 8. The port has a large range of facilities including minor ship repairs, bunkers, etc.

Depths—Limitations.—Container, ro-ro, and general cargo terminals are available. Five berths, numbered W to E, have the following dimensions:

Berth No.	Max. LOA	Depth	Usage
1	155m	7.9m	Cruise ships
5/6	189m	7.9m	Cruise ships
7/8	412m	7.9m	Container, general cargo, and ro-ro

Anchorage.—Hamilton Harbor is not considered to be a good hurricane anchorage. The holding ground is good, but space is limited. In such circumstances, Great Sound is considered preferable.

Anchorage may be obtained in the West Harbor as required, in general depths of 5.1 to 16.7m, over a bottom charted as mud and shells. Vessels with drafts in excess of 7.9m must anchor in Grassy Bay or Great Sound.

Caution.—Numerous small craft, which may not be carrying anchor lights, may be found in Hamilton Harbor, clear of the main fairway.

Little Sound (Port Royal Bay), in the S part of Great Sound, is a clear, comparatively deepwater basin somewhat sheltered throughout by surrounding landforms. The former U.S. Naval Air Station (Annex), Bermuda occupies most of the W side of the basin as well as all of the reclaimed land area extending along the N side to **Kings Point** (32˚16'N., 64˚51'W.), not to be confused with the Kings Point, about 2 miles to the NNW.

A buoyed channel, with a charted least depth of 9.7m, is dredged through a sunken ridge joining Kings Point with the somewhat hilly and lightly forested Grace Island.

A steep-sided, relatively deep hole lies in the W part of the bay and the remarkable chimney of a private residence stands on Wilsons Island (Five Star Island) in the S part of the bay.

Vessels, having transited Dundonald Channel and intending to enter Port Royal Bay, should proceed so as to pass through the channel dredged between Kings Point and Grace Island and then continue on to destination.

Vessels commonly moor, under the direction of local authorities, to one of several buoys lying opposite the Naval Air Station. A tender pier extends 150m SSE from the Naval Base, on the S side of Kings Point. On the E side of the pier a ship berths on dolphins in depths from 9 to 11m.

On the W side there are depths from 6.7 to 8.8m alongside the pier.

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